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PRACTICAL REMARKS  
ON  
SCARLATINA,

BY S. WATERMAN, M. D.

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## Practical Remarks ON SCARLATINA.

By S. WATERMAN, M. D.

So many treatises have been written on Scarlatina, that we should suppose the subject fully exhausted, its pathology settled, and its therapeutics fixed. Yet this is by no means the case. Much of it remains obscure and unexplained to the present day; even the history and progress of this disease is shrouded in darkness. All that we know positively of its origin and progress is, that it has invaded successively country after country, until with few exceptions it has spread all over the globe. No other disease presents such a variety of symptoms, such a diversity of modifications, or has been the subject of such diverging opinions respecting its causes, pathology and treatment; and none defies in such a manner the theories of the learned, and the skill of the practical physician. Experience alone has gradually settled some principles of treatment, whereby its malignity can be modified, and its most treacherous attacks warded off.

Under Providence I have been in a measure successful in combating this disease, so that I feel encouraged to offer a few practical observations, which will stand the test of a critical examination, and will be found useful to the young practitioner; hoping thereby to add my humble mite to reduce the great fatality of this treacherous malady. There may not be in my remarks much that is new or brilliant, but we find most generally that simple common sense views, so successful everywhere else, are too often discarded in the practice of medicine; and that many practitioners delight in brilliant theories, rather than follow the path of patient observation and philosophical deductions. In no disease is it more necessary to observe and to individualize than in Scarlatina, which offers all the varieties of malignity in one and the same season, is followed by the greatest diversities of sequelæ, is like a raging, surging sea now, and placid and serene in a few hours afterwards, and so the reverse; a disease whose most destructive inroads are sudden and unexpected, and which even after having destroyed life, leaves often no traces in the body by which we could unravel the pathological changes wrought by this subtle poison. He who would successfully contend against such an enemy must be wary and watchful; above all he must know thoroughly the avenues through which it rushes with destructive velocity. Let the practitioner hold fast to the idea that Scarlatina is a disease of the blood, produced by the deleterious effects of poison, miasmatic, fungoid, or otherwise, of whose nature and mode of invasion we do not know anything certain as yet, and he will at once understand

why the disease may localize itself in so many organs, and affect them primarily as well as secondarily, and that it is necessary to eliminate this poison from the system entirely, before our patients can be considered safe and out of danger. Let him remember that the system naturally endeavors to effect this elimination through the skin, kidneys, and bowels, and that the fever present is a reactive fever brought on by, and necessary to overcome, the sanguineous toxication; that the disease has to run a certain course, which ought not to be and cannot be interfered with, without imminent danger and risk. He must avoid hasty interference when the reactive fever runs high, and must remember in this connexion this one great axiom, that this fever is not strictly a phlogistic or sthenic fever, and subject to the full exhibition of antiphlogistic treatment, and that blood-letting, active purgation, and the free use of the antimonial preparations, which he may have seen recommended in the books by theorists, are apt to prove injurious in the great majority of cases; sudden collapse often following the employment of these heroic remedies. Suffice it to say that since 1853 I have not made a single venesection, and applied leeches only in a very few cases, and I have no reason this day to complain of my course.

In my experience I have found the disease frequently to have rather a typhoid character, if I may use the term understandingly. The action of the heart is at first impetuous, sometimes to a degree likely to deceive the unwary, and often becomes weaker in a very short time; there is early exhaustion and paralysis of the nervous power, and the employment of full antiphlogistic treatment would be fraught with most immediate danger. The reason, it seems to me, is obvious. It is in consequence of the presence of scarlet fever poison in the blood, which undoubtedly exerts a paralyzing influence upon the capillaries, that a delay in the circulation and return of the blood to the heart is caused. The heart endeavors to overcome this obstacle by more forcible and more frequent contractions; more blood is sent to the already engorged vessels; the difficulty instead of being mitigated is increased thereby; this forms the state of congestion which we witness in the capillary vessels of the skin, causing the peculiar scarlet color, but which is also the case in other and more vital parts of the body. Such extensive congestive processes cannot go on for any length of time without inducing morbid changes in the parts congested. The congested organs have their functional powers alienated or destroyed; their secretions are either suppressed or vitiated; transudation and exudation take place through the walls of the paralyzed capillaries. It is my opinion that under such



a state of affairs, we ought to husband the strength of the patient rather than to break it down; to soothe and mollify rather than to drain the resources of the system to a dangerous extent. The reactive fever I have never found to be purely inflammatory, and the higher the reaction the sooner I have found the patient grow weak and exhausted. I do not contend that there may not be epidemics, where the fever is truly of an inflammatory character, and where blood-letting and general antiphlogistic treatment may become necessary; but until such epidemics occur and the experience of the profession establishes such a necessity, I shall consider depletion dangerous and the antiphlogistic apparatus of very doubtful utility. It is a fact established to my satisfaction that the suddenness of the attack, the violence of the symptoms, the serious lesions resulting from the virulent poison, and the terror with which the disease impresses the unwary practitioner, is prone to lead to over medication. Let me narrate a case in point. In 1861, I was called to a case of scarlatina. The parents had lost two children from the same disease. The doctor who attended the family, a very worthy and talented colleague, became discouraged and advised the parents to seek medical advice elsewhere. When I came into the sick room I found the whole mantel-piece full of half empty vials, boxes, and pots. It was at once manifest to my mind what made my colleague so unlucky. The array of bottles told the story—"over medication." I saw the patient. The fever was mild. I ordered a coat of lard; simple diet; cold and emulcent drinks, and to the astonishment of the parents, not a particle of medicine. I watched my patient carefully, examined the urine, no complications arose, and the child got well. It was satisfactory to me; it was more so to the parents, for it was the only child left them.

I shall not dwell upon the accepted manner of development and time of incubation, although I have reason to believe that it is at times much longer in manifesting itself than is generally conceded, and I have but little to say as to the treatment in mild cases, because little or no treatment is necessary; but I insist upon one point, that no practitioner is warranted in relaxing his watchfulness because the disease runs a mild course. The sequels peculiar to Scarlatina are not dependent solely upon the mildness or severity of the case, because many severe cases get well without secondary complications, and milder ones terminate fatally long after the disease proper has disappeared.

The scarlet fever poison circulating then in the blood, we must be prepared to meet its effects in all the tissues of the living body.

It is very prone to manifest itself in the nervous centre, the Brain. This organ receives a very large

quantity of blood for home consumption, and with it of course a large amount of scarlet fever poison is carried there by the sanguineous current. This accounts for the early and frequent invasion of the brain, and explains the brain symptoms, such as convulsions, cerebral irritation, congestion and torpor, which usher in the disease.

The danger from the invasion is generally not so great as might be supposed at the first glance; it will depend upon the intensity of the scarlet fever poison and its exclusive localization in the nervous centres. Cerebral and spinal irritation and even paralysis of the nervous power ensues rapidly when the poison is concentrated and strikes the organ in its totality. Where the toxication has been moderate and where the brain receives no more than a due proportion of the poison, the cerebral symptoms may be correspondingly mild, and they may be wanting altogether. The brain, by a well known law, possesses the power of accommodating itself readily to pathological changes in the sanguineous fluid, provided the change takes place gradually, and does not over-power it at once.

Thus if the convulsions are promptly met by proper and adequate measures, so long as the natural emunctories are in condition to eliminate the poison, the cerebral and spinal symptoms will speedily disappear. In a few rare instances I have observed the attack upon the nervous centres to be so violent that the vital powers of the patient were prostrated at once and in toto. It is quite different with cerebral and spinal meningeal troubles arising during the stage of efflorescence and desquamation, where the exanthem suddenly disappears, or where the poison has not been eliminated through the natural emunctories. In these cases the poison has had ample time to work destructively upon the Hæmato-crystallin of the blood, suspending its power to absorb and distribute oxygen for purposes of oxidation, thus prostrating the vitality of the internal organs, and the consequences are correspondingly more dangerous, and less under the control of curative agents.

In all cases where convulsions usher in the disease our endeavor must be to give, if possible, immediate relief. In many cases I have found Chloroform an anæsthetic of inestimable value. I allow it to be inhaled until the convulsions cease, and employ it as often as they may return. Enemas of Assafœtida, the warm bath with mustard, and the cold shower to the head, are valuable adjuvants in such cases, and internally I give calomel and zinc. The following is the formula I am in the habit of prescribing and which will be found worthy of confidence.

Hydrarg. Submuriat.	gr. ii
Zinc. Oxyd.	gr. iv.
Kali: Nitric.	gr. xii.
Pulv. Herb. Digit.	gr. ii.
Sacch. Alb.	gr. xii.

Divide in Chart. No. 8. S. give a powder every two hours.



I have great faith in *Zincum oxidatum*, as a sedative agent in inordinate excitement of the brain and the nervous centre, unconnected with inflammation. It may produce vomiting at first, but the stomach will tolerate it very soon, and it should be given until all cerebral excitement is relieved.

When the invasion has been so severe as to cause cerebral torpor, external rubefacients, the warm bath with mustard, and friction with the volatile liniments may be used; the cold shower to the head is also an excellent means to raise the nervous power; while internally, the diffusible stimulants such as brandy, musk, castoreum, camphor, and carbonate of ammonia will be found remedies worthy of trial. I prescribe the following formula:

R. Ammon. carbon, } *aa grs. iv.*  
 Moschus, pur. }  
 Sacch. Alb. gr. x  
 Divide in chart No. 4.

A powder to be taken every two hours.

Seek to excite the activity of the skin and kidneys, for upon it will often depend the fate of your patient. I have confidence in the Oil of Turpentine, both as a rubefacient and as an internal remedy at this stage; it must, however, be employed with great caution. The patient must be watched diligently, as cerebral torpor sometimes changes rapidly into cerebral irritation, and the reverse. Those acquainted with disease know this very well, for as cerebral torpor may result from the toxication of the blood, it is inclined to yield whenever the elimination of the poison begins through the natural channels; reactive fever ensues and may quickly conjure up all the symptoms of cerebral irritation. Whenever, therefore, the first symptoms of reaction appear, all stimulants must be immediately discontinued, and such remedies be selected as will answer the indications of the various individual cases. This rule seems to be simple enough, yet it requires often a nice power of discrimination to settle the point accurately. The following cases are interesting as showing the various modes of attack upon the nervous centres and the results of treatment resorted to.

*Case 1.*—Master Goodman, about eight years of age, was attacked by scarlatina during the fall of 1861. When I saw the patient the scarlet eruption was perfectly developed. On examining his pulse it was about forty per minute, rather small and compressible; the countenance expressive of passive indifference, the eyes glassy and staring; temperature natural. He complained of no pain, there was no angina, no swelling of the glands, and there had been no convulsions. His urine passed freely and contained no albumen; his bowels had not been moved that day. I ordered brandy freely, which he continued to take for more than one week. At no time during these eight days did the pulse

rise over sixty per minute; the period of desquamation passed off without any complication; at the ninth day the pulse rose gradually, and the patient made a speedy recovery.

*Case 2.*—This case was attended by me in January 1864, on the morning of the 19th. The child of Mr. Wolf, aged three years, was taken with convulsions which lasted about five minutes. It then rallied and became cheerful. As it had had convulsions in the previous year the parents did not feel alarmed. In the afternoon about four o'clock the child was again attacked with convulsions, and I was sent for. When I arrived the fit was over. I found great arterial excitement and a certain degree of strabismus. Otherwise the child was conscious; I soon observed, however, that it had a troubled vision; it stretched out its little hands in the direction of its playthings, groping some time before getting hold of them. It grew worse during the night, became perfectly blind and comatose next morning, with a slow thread-like pulse. On examining I found a slight scarlet eruption about its breast and upper part of the arm. The warm mustard bath with cold showers to the head, quinine and hydrag. sub-muriat. in five grain doses twice a day, and Kali Iodatum in solution, one scruple per day, was given. On the 21st the child was raving, tried to bite its hand and those who tried to soothe it, struck its head against the bedposts, and cried with that shrill voice peculiar to acute meningitis. The pulse on that day was about one hundred; urine I could not obtain as it passed involuntarily in the bed. On the 22nd I found the patient much better. The quinine had exerted a soothing effect, the child slept and was quiet, and only when awakened stared wildly about, but began to recognize its parents and speak a few words; stools free and peculiar; I continued the same treatment. On the 23rd I found all the symptoms much improved. Discovered some patches of eruption around the thighs and groin; discontinued the calomel but gave quinine, five grains once daily, and the Iod. Kali. solution. The child got perfectly well, with the exception of a slight degree of strabismus which remained.

*Case 3.*—S. Lubarch, a boy four years old, was seized during the month of December, 1853. The eruption was distinctly visible on the third day. The fever was not violent, nor was there anything in the case to warn me of approaching danger. Urine and stools natural, temperature of the body fair, skin moist, tongue moderately furred, thirst not great, anginal symptoms moderate also. I saw him at nine o'clock; he was delirious and wandering at two P. M., sunk gradually and died at nine P. M. that same day. I need not state that every effort was made to sustain the sinking powers, yet



the intensity of the toxication was such that the brain succumbed without any effort at reaction.

*Case 4.*—E. Miller, three years of age. Was suddenly taken with convulsions. No cause could be assigned for the attack; the child seemed well and hearty before it was taken sick. Chloroform was exhibited until the fit ceased. A warm mustard bath and the internal use of the zinc and calomel powders sufficed to tranquillize the nervous excitement. A profuse scarlet eruption followed within a few hours. The disease ran a regular course, was peculiarly mild, was followed by no sequelæ, and got well rapidly.

*Case 5.*—Mrs. Joseph having been delivered with forceps in February 1869, and passed 3 weeks in child-bed, with great comfort and without the least disturbance of the lochial discharge and the secretion of milk, was taken with a swelling and severe pain in the mamma, and an excessive fit of vomiting, which lasted twenty-four hours without intermission. She had high fever and became comatose and unconscious. Ice and Codein finally controlled the vomiting, but were discontinued as soon as symptoms of cerebral torpor appeared. A few isolated red patches on the face attracted my attention, and on examination a scanty eruption could be seen on the chest and back. But as the patient was twenty years old, the idea of Scarlatina was not entertained. One of our best physicians who was called in, thought it was a case of uræmic poisoning. Musk, Camphor, and Carbonate of Ammonia, with wine and brandy were given freely, which were followed in due time by a full and copious scarlet eruption. Urine free from albumen.

There was no throat disease present and it seems that it was replaced by the swelled mamma, which ran to suppuration and yielded well and readily to quinine and iron. The patient made a regular recovery after a most copious desquamation.

The disease is sometimes ushered in by inflammatory manifestations in the mucous membrane of the throat, the palate, the uvula, and the tonsils.

The symptoms are generally mild, yet at times they reach a very high degree of intensity, and croupous, bronchial, and pulmonary attacks with excessive dispnœa, are by no means rare. In the milder as well as in the more severe cases, the action of an emetic is very useful, and even at times indispensable, ipecacuanha, or the golden sulphuret of antimony being preferable, unless there is a necessity for an immediate action, when the cuprum sulphuricum in  $\frac{1}{4}$  grain doses, either alone or combined with small doses of calomel, may be administered.

So soon as the emetic has operated and the respiration has become free, I have administered the mineral acids, the Acidum Sulphuricum or the

Acidum Muriatricum; I prefer the former. They can be given mixed with Raspberry Syrup, an elegant form and relished by the little patients.

Acid. Sulph. dilut,  $\mathfrak{z}\text{i}$   
Syr. Rubi; Idæ  $\mathfrak{z}\text{iiss}$   
Misce. a teaspoonful every hour or two in water.

The acids act very gently, allaying the burning thirst and limiting the deleterious influences of the Scarlet fever poison. Recent researches go to prove that the action of these acids on the blood is to fix more permanently the oxygen which it constantly absorbs, and thus early to counteract the process of decomposition of the sanguineous fluid, to which it is so prone in this disease. The acid will be found especially serviceable when diphtheritic exudation appears in the throat, which rapidly disappears under its action, especially if early exhibited. In milder cases where the lungs are free, the Kali. Chloricum, the Spirits Mindereri, in combination with Syrup. Scillæ (which is prepared with Acetic Acid) or the Acetate of Ammonia with Syrup. Scillæ, may prove sufficient. And here I will mention a remedy that has my fullest confidence, and which I prescribe in all instances, whatever be the character and complication of the individual cases, whether cerebral or anginose; in all stages of the disease, I have invariably employed it with success: *It is a coat of fresh lard.* The beneficial action of this simple remedy upon the whole disease is really surprising. No other local application, whether the warm, the tepid, or cold bath as recommended by various authors, nor the washing with Aqua. Chlorinata, or any other agent known to me, can surpass in efficiency this simple dressing. The skin that was hot, burning, and tense, becomes under its influence soft and pliant; the burning sensation is allayed, the high temperature cools gently down. This beneficial action produces a corresponding influence upon the reactive fever, which loses its irritative character and becomes milder and supportable; it assists materially the internal use of acids in allaying the burning thirst, whilst a gentle transpiration moistens the skin but recently so hot and dry. With the sedative effects upon the circulation comes corresponding relief for the inflamed, parched throat.

The lard ought to be applied morning and evening, being first gently warmed. The whole body ought to be covered. Aside from the beneficial effects mentioned, the coat of lard forms an excellent protection against sudden changes in the temperature of the sick room, and is urgently asked for by the little sufferers after one or two applications.

When the tonsils, the parotid, submaxillary, or sub-lingual glands are inflamed, painful or swollen, the external applications of Liniment. volat. camphorata in mild cases, and the Unguent. Iodat,



mixed with an equal part of simple cerate, in more severe cases, will be found very serviceable.

When the tumefaction, tenderness and pain is very severe, and the fever bears the character of a phlogistic reaction, leeches may be applied to the tumefied surface, followed by an unirritating poultice. The poultice I employ is the

Species Emolientes. (Pharmacopœiæ Borussicæ)  $\frac{3}{4}$  vi.  
Pulv. Herb. Belladonæ  $\frac{3}{4}$  ij.  
Misce. f. species ad cataplasma.

In these severe cases the throat should be examined carefully daily, and whether diphtheritic exudation be present or not, as long as the mucous membrane of the fauces appears red and inflamed, the nitrate of silver should be supplied in solution, iv grains to the ounce of water, once daily. When the Angina has a diphtheritic character the acids should be given, combined with quinine or the decoction of the cinchon rubrum.

R. Cortex. cinchon. rubr.  $\frac{3}{4}$ ii— $\frac{3}{4}$ ii  
fac. infus. secund. art. ad  $\frac{3}{4}$ iii  
Acid. Sulph. dilut.  $\frac{3}{4}$ i  
Syr. Rubi Idæ  $\frac{3}{4}$ i

M. D. S. Give a teaspoonful hourly to a child two years old.

Often a troublesome cough is present from the beginning, resembling in its ring the croup. It is rarely croup itself, however, at least I have seldom found it so, and an emetic of ipecacuanha followed by a cough mixture containing some opiate, Squills or Senega, will control it.

The force of the cough and the laryngeal irritation will diminish as soon as the eruption has fully developed itself. When no diphtheritic inflammation is present, small doses of Calomel and golden Sulphuret of Antimony, say two grains of each, divided into eight powders, may be very efficient; to combat croupous cough one powder may be given every two hours, and should low fever be present at the same time, the addition of  $\frac{1}{4}$  to  $\frac{1}{2}$  grain of camphor will be found very advantageous.

In a number of cases I have observed an early localization of the scarlet fever poison in the kidneys. The children thus affected, in the premonitory stage complained of difficult micturition, whilst the urine passed was scanty and contained albumen. These cases were easily controlled by proper medicines, such as the mustard bath, the local application of liniment Volat. Camphorat. with Oleum Terebinth. in proportion of  $\frac{3}{4}$ i of the former to  $\frac{3}{4}$ ii of the latter, and the infus. coloquintidæ, the formula of which will be mentioned hereafter; and the application of hot brandy by means of a flannel to the region of the kidneys. The strangury and the albuminuria generally vanish as soon as the eruption is fully developed. In a recent case the strangury and the scanty secretion of urine were followed by frequent and copious discharges of urine, so much so, that I

became alarmed at the enormous quantity discharged. The urine ran in the bed apparently without the patient being conscious of it, whilst the brain seemed in so far only affected that some drowsiness was present. In this case the early exhibition of the acids and Sulphate of Quinine did me excellent service, and relieved this distressing symptom in a few days, securing to the patient an early recovery.

Vomiting and retching often usher in scarlatina. It seems to me a sympathetic or reflex action of the nervous centres. In these cases I hold the affection of the brain to be slight, and the revulsive action of the stomach salutary. The matter ejected is of a ropy, slimy consistency, tinged with bile; the stomach itself sometimes feels tender on pressure. It is often the case that the stomach sets up a vicarious action for the relief of the congested kidneys, and I would advise before hastening to relieve the vomiting, to examine closely the state of the urine, especially for albumen, and the quantity of urea excreted in twenty-four hours. Proper remedies for the renal disturbance will often be found the best and surest means of relieving the retching and vomiting. Of these remedies we have already spoken partly above, and shall dwell more fully upon them when we consider the affection of the kidneys in desquamative nephritis.

Where the vomiting is not referable to the kidneys these symptoms disappear promptly, as soon as the eruption appears. Here the application of an embrocation of hot wine or brandy over the stomach by means of flannel, and internally ice pills, or the Tinct. Opii. Camph. in small doses will be all that is necessary.

Diarrhœa and tenesmus are also sometimes observed at this stage; yielding promptly to warm enemas made of the infus. of the German Chamomile containing a few drops of laudanum, to hot brandy over the abdomen, and to small doses of Dover's powder with Camphor.

THE EFFLORESCENT STAGE, OR STAGE OF ERUPTION.

—The majority of cases arrived at this stage run a mild course. The abnormal cases are those of imperfect eruption, or where the exanthema is wanting altogether, technically designated Scarlatina sine eruptione. Even many of these cases run a mild course. Sometimes, however, a scanty or imperfect eruption is the result of a high degree of perverted nervous power, and is accompanied by a corresponding high degree of irritative fever. The poison is then generally localized in some internal organ. Where? Most probably in the kidneys and lungs. In this state I know of no more speedy and certain remedy than an emetic of ipecacuanha, which will induce free transpiration, and will assist promptly to determine the exanthema to the skin.



The milder sudorifics, Acetate of Ammonia, Spts. Mindereri, Potass. Nitrat., Sodæ Nitrat., Potass. Acetat. and Camphor water may be employed. When the exanthema is erratic or wandering, coming and going rapidly, there is great danger, and the utmost vigilance should be exercised to detect at the earliest moment the point of attack. The brain, the lungs, and the kidneys are most likely to be the assailed points. Here the warm mustard bath two or three times daily, serves an excellent end by determining the exanthema to the skin. The early employment of quinine or bark is also indicated.

The varieties known as *Scarlatina milleformis* and *Scarlatina pustulosa*, have in my experience proved more violent than the preceding varieties. The re-active fever assumed in them a more phlogistic character, and the complications were frequent and more difficult to manage.

COMPLICATIONS DURING THIS STAGE.—Most generally when the exanthema has been fully developed, there is a marked amelioration of all symptoms; the fever moderates; cerebral congestion is relieved and disappears altogether; retching and vomiting and all other gastric symptoms are allayed; the angina is greatly mitigated; natural sleep returns, and the secretions become normal. In some instances, however, this is not the case; the febrile action continues unabated in violence, and the morbid processes of the internal organs and abnormal secretions also. It is rare that during this stage, in an otherwise mild case, fresh complications arise, unless it is in patients where the elimination of the poison is either interrupted or improperly performed, or it is concentrated in some internal organ.

One of the most frequent complications during this stage, is an affection of the joints, having very much the character of articular rheumatism. Pain and swelling are sometimes very severe. Here I have found dry warmth, wrapping the joints in cotton batting, and an embrocation of Camphorated Oil, with a small quantity of the Tinct. Opii. Crocata. sufficient to soothe the pain. The complication is generally of short duration.

The glands, especially the parotid, sub-maxillary, and sub-lingual glands, are apt to be affected during this stage. It is necessary to meet this complication promptly. The Ung. Iod. (Pharm. U. S.) is an excellent remedy, applied externally three times daily. It may be diluted with simple cerate if it should prove too irritating for the patient. When the affected glands do not yield to the Iodine, they may proceed to suppuration, which they do sometimes very slowly, but sometimes also extremely rapidly. The practice is, to open these suppurating tumors as soon as practicable. In one case I remember the early opening did not turn out well. At first

laudable pus was discharged, but within twenty-four hours the tumefied gland began to discharge an ichorous, offensive fluid. Quinine, acids, and wine were promptly administered. The tumor assumed a waxen and translucent appearance; soon a fungus-like growth protruded through the incision, and the patient died rapidly under symptoms of extreme exhaustion. Congestion of the kidneys and suppression of urine, may take place at this stage, and be of more serious consequence than that which may take place in the previous stage. I do not desire to theorize, but fully agree with Constadt, who thinks that albuminous urine may be secreted in many instances without renal disease; that in *Scarlatina* this may be the case on account of the abnormal condition of the blood, it being surcharged with fibrin, favoring the precipitation of albuminous and fibrous molecules within the kidneys; that the albuminous precipitation may result in the permanent retention of at least a portion of it within the parenchyma of the organ, which may secondarily produce all the characteristic changes of Bright's disease.

This peculiar state may be produced in a more simple manner, as ingeniously shown by Prof. Goodfellow, of London, in his book on Bright's disease and dropsy. He says the scarlet poison exerts a direct and paralyzing influence upon the capillary vessels; this will cause a retardation of the blood current; the heart tries to overcome this retardation, as evidenced by the bounding pulse. In this effort the power of the heart is exhausted, whilst the capillary vessels are distended, their walls thinned, and exudation and transudation facilitated. The more liquid portion of the blood first exudes; this is serum containing albumen. This process may not only go on in the kidneys, but in the skin and cellular tissue also. If the stagnation is great, we may meet with blood corpuscles in the urine, and also all the other elements of Bright's disease, such as fibrous casts, blood corpuscles, and epithelial cells.

But the congestion may be so great and the action of the heart so violent, and the condition of the capillary and even the larger blood-vessels of the kidneys may have become so fragile as to induce apoplexia renalis. I have seen such a case in the winter of 1864, in a child six years old. The hæmorrhage was truly enormous, more than eight ounces being discharged with the urine at a time when I was present; the hæmorrhage lasted three days, and yielded to large doses of gallic acid, a remedy that goes unaltered to and through the kidneys and whose presence can be shown in the urine by the addition of sesqui-chloride of iron to the urine, with which it forms an inky black.

All the precautions already given must be re-



doubled now. The urine must be carefully examined as to quality and quantity daily, as it is of great importance that the examination should be rigid and precise; and as the life of the patient will often depend upon the prompt and scientific manner with which the examination is conducted, I will here give the simple rules for examining for albumen, as laid down by Dr. Bird in his work on urinary deposits. p 278.

*a.* Heat will produce a white precipitate in urine containing an excess of earthy phosphates. Distinguished from albumen by disappearing on the addition of a drop of any acid.

*b.* Heat being applied to urine containing deposits of urates, will sometimes if actual ebullition be prolonged, produce a deposit of an animal matter (trioxide of protein) insoluble in nitric acid. This is rare, but is distinguished from albumen by being deposited only after protracted ebullition.

*c.* Nitric acid will often produce white deposits in the urine of patients under the influence of Copaiva, Cubebs, and perhaps some other resinous diuretics. Distinguished from albumen in not being produced by heat.

*d.* Nitric acid will in some concentrated urine, as in the scanty secretions of fever, often produce a dense buff-colored amorphous precipitate of uric acid. Distinguished from albumen in not being produced by heat.

*e.* Albumen may be present in urine and not be precipitated by heat, provided the secretion be alkaline. If therefore, urine suspected to be albuminous, is capable of restoring the blue color of reddened litmus paper, nitric acid must be used as a test; as albumen when combined with alkalies does not coagulate by heat.

*f.* Albumen may be present and yet escape detection, by using dirty test tubes. A small quantity of an acid, or a little solution of potash or soda left in the tube, will prevent the precipitation of albumen by heat from urine boiled in such a tube.

*g.* It may occasionally happen that albumen may be present in the same incipient or hydrated state in which, according to Dr. Prout it occurs in chyle. Heat scarcely effects this variety, but nitric acid immediately coagulates it.

The occurrence of dropsy in scarlatina has very often been ascribed to the influence of cold, or to imperfect desquamation. I fully believe that many cases may be traced to the early engorgement of the kidneys, with blood overcharged with Fibrin and Albumen, and that during the efflorescent stage the foundation is laid for future renal disease and consequent dropsical disorders.

That such engorgement takes place is often evidenced by bloody micturition. The microscope will reveal then in the albuminous urine, the pres-

ence of Hæmatin, along with a variable number of entire blood corpuscles.

Where Hæmatin is thus micturated, my experience has proved the great utility of the internal use of opium and plumbum aceticum, whilst at the same time small doses of quinine and the milder ferruginous preparations may be exhibited with benefit.

The idea has presented itself many a time, that in the outset the albuminous effusion is an attempt of nature to relieve the congestion of the kidneys. How necessary then to detect the first traces of this salutary effect as early as possible, so as to assist nature in a rational manner and by rational means, ere structural changes have taken place in the kidneys, which we are so seldom able to cure. As soon as albumen is detected in the urine, we should endeavor to restore the functions of the skin if they have been suppressed.

The skin may be employed for a short time to perform the depurating functions for the kidneys. The warm bath several times daily, warm flannels and friction with flannels will be found highly beneficial. Avoid powerful diuretics; they will seldom render relief; on the contrary they will often aggravate the disease. The intestines may be made to assist with more advantage. The Coloquinths will almost act as a specific in such cases. Give the infusion, according to the following excellent formula.

Fructus Coloquinth	℞i.
fac Infusum add	℥iii ss
Syr. Simplex	℥ss.

M. D. S. a teaspoonful every two hours.

I continue to give it until two or three slimy stools have been passed, and tenesmus begins to manifest itself. It will be found that the urine becomes freer at the same time and is less charged with albumen. Mercurials have been condemned by some in this state of the kidneys, but I have used Calomel occasionally with advantage in combination with Jalap, in cases where the disorder was functional; I doubt its propriety in cases where the disorder is structural. Give plenty of warm diluent drinks or even cold water with some pleasant syrup. Dry cupping to the loins will be found useful; an infusion of Pumpkin seed, and the internal use of the diluted Nitric, Sulphuric and Muriatic Acids will be found to exert a decided effect upon the malady. I have also tried the Carbonate of Ammonia in full doses and found it an excellent remedy in cases where the uræmic toxication begins to effect the brain. In one instance of this kind I saw rapid amelioration of all symptoms and an increased secretion of urine, wherein the albumen grew less in quantity from hour to hour.

The following is the formula in which I prescribe this remedy.



R Ammon. Carbon.  $\mathfrak{z}\text{i}$   
 Aquæ. distillat.  $\mathfrak{z}\text{iii}$   
 Syr. Simplex.  $\mathfrak{z}\text{i}$   
 Misce. S. a teaspoonful hourly.

In plethoric children it is advisable to apply one or two leeches to the region of the kidneys. External embrocations of Oil of Turpentine with Liq. Ammon. caust., and the application of hot brandy, are auxiliaries which will prove highly valuable. It is a curious fact that the Carbonate of Ammonia will produce salutary effects in renal congestion and in uræmic toxication, whilst urea retained in the blood during these morbid processes, (according to the best authorities) is decomposed within the system into Carbonate of Ammonia.

Even where there is no trace of albumen to be detected, scanty urine, or the total suppression of this secretion, must at all times excite our suspicions and our watchfulness; uræmic toxication may be the consequence, and be followed by delirium and death in a very brief period of time. I have seen a case however, in which no secretion of urine had taken place within forty-eight hours. There was great disury and frequent urging to pass water. The catheter being introduced, a few drops of highly concentrated urine were passed. The case yielded to the mixture of the Carbonate of Ammonia and to the external application of the Terebinthinate Liniment and warm embrocations of Brandy.

I have cured some cases of obstinate suppression of urine in this stage, by using an infusion of the Radix Aralia Hespida, (dwarf elder), and the Iodide of Potash. The following is the formula:

R Rad. Aralia. Hespida.  $\mathfrak{z}\text{ii}$   
 fac. infusum. ad  $\mathfrak{z}\text{iiiss}$   
 Potass. iod.  $\mathfrak{z}\text{i}$   
 Syr. Gum. mimosæ  $\mathfrak{z}\text{ss}$

M. D. S. A Teaspoonful every two or three hours.

Laryngitis often befalls the patient at this stage; meet it promptly by emetics. In most cases ipecacuanha will be sufficient, and in robust children with undoubted phlogistic fever and full and frequent pulse, the golden sulphuret of antimony in small doses, from  $\frac{1}{4}$  to  $\frac{1}{2}$  grain, combined with calomel and leeches externally may be employed. If an immediate emetic be needed rely upon Cuprum Sulphuricum in  $\frac{1}{4}$  grain doses until the desired effect is obtained. In diarrhœa give Dover's powder, but do not stop it abruptly. Delirium present during this stage, is an evidence of cerebral irritation. The brain receives, as we have seen, from all the organs, the largest amount of blood for home consumption, and must naturally feel the impaired nourishing capacity of said blood, and must more or less react against the poison circulating within it. As remarked before, so long as the skin, the kidneys and the bowels act regularly, I have not seen any danger following a moderate amount of cerebral ir-

ritation. Where the cerebral symptoms are more severe and where the danger seems imminent that the irritation may turn into cerebral torpor, the practitioner must proceed secundum artem. In the milder cases the Zinc. Oxyd. either alone or with Calomel, the Aqua Oxymuriatica and the mineral acids deserve our full confidence. The solution of the Carbonate of Ammonia has also done well in several cases under my observation, where the cerebral irritation originated from uræmia. Occasionally the liver is torpid and congested, with a tendency to inflammatory action. Calomel may be given here in small doses, also Opium if not otherwise contra-indicated, and dry cupping externally. Should Cardiac disease supervene, of which I have seen only a few cases, use externally the Empl. vesicator; and dress afterwards with an unguent of equal parts of Mercurial Ointment and Empl. Belladonnæ. Internally, Calomel and Digitalis may be cautiously employed.

During this stage as well as in the preceding one, preserve an even temperature in the sick-room, promote the normal action of the natural emunctories and the normal secretions generally, by the mildest means; do not stimulate patients except when the necessity arises; support them by light nutritious diet; allow them plenty of cool acidulated drink, and if desired, you may give moderately, roasted apples, a slice of orange, or some other ripe fruit; always also persevering in the application of the coat of lard. With regard to ventilation care should be taken to protect the patient from drafts. Where two rooms communicating can be had, let one room be ventilated, whilst the children are kept in the other, and change rooms thus freely. The proposition to whitewash the sick-room, emanating from Dr. Goodfellow, I have not found advantageous, and I abandoned the practice some time ago.

When the desquamative stage has been safely reached, many practitioners think the coast clear and the cure accomplished. Vain hope! It is during this stage that many of the most dangerous complications arise, and where they suddenly terminate fatally in cases thought to be perfectly safe.

Looking with a critical eye over the whole process through which Scarlatina runs, the process of depuration, that is, the expulsion from the blood of the entire toxicating principle, is the condition of a perfect cure. Whatever then interferes, or has interfered with this depurating process, causes the most serious consequences at this stage, where the system has been weakened and exhausted by the disease, and where the poison has had ample time to work pathological changes in the blood and vital organs. If therefore the kidneys have been neglected during the stage of efflorescence, and if due attention has not been bestowed upon the perfect



elimination of the poison from the system, and if its insidious working has been allowed to go on unchecked, it must not surprise us if the disease suddenly assumes a formidable and highly dangerous character and defies the hasty medication which will then be resorted to. It is a deplorable fact that some practitioners never rise to the full realization of the great responsibility of the medical profession. Such will learn too late that the disease has defied their superficial efforts and their hasty and impatient visits in the sick-chamber, where they have left their patients without that strict, anxious and critical examination, in the absence of which there can be no professional success and no safety. Once firmly rooted within the innermost texture of the vital organs, the disease will seldom be dislodged from its position, whilst in its incipient stage it would have yielded promptly to simple medication. This is true also of the lungs, the heart, the brain, and the kidneys. It has been contended that an interruption of the process of desquamation is favorable to the development of internal disease, especially dropsy and anasarca. Exposure to cold has also been assigned as a cause of morbid action. I have reason to doubt the general correctness of these views. Many cases I have seen where the desquamation was hardly perceptible, without the least injury or the slightest evil consequences to the patient, whilst in cases in which the process of desquamation was evidently perfect, serious and fatal troubles followed. Cold, I know from experience, is capable of producing serious complications throughout the disease, yet many children bear exposure to cold without any difficulty. I hold that we understand but imperfectly the precise part the desquamative process plays in this disease, and it is by no means a firmly established fact that when perfect it gives immunity against the sequels of Scarlatina. As remarked above it is more reasonable to suppose that these evil sequels result from the inability of the system to throw off the poison that has invaded it; that by some law this poison gains in volume by its prolonged retention within the system, probably setting up zymotic action, and that its inroads, insidious at first, may at once assume formidable proportions. It is reasonable to suppose that aside from the direct paralyzing influence of said poison upon the nervous system, it would exercise a disintegrating influence upon the Hæmato-crystallin of the blood with which it is so long in contact. We certainly find in many cases a diminution of the red corpuscles, as evidenced by the pallor and anæmic appearance of the patient. We can demonstrate this fact by the microscope in the living and by autopsies in the dead subject. This diminution of the red corpuscles produces also a diminished capacity for the absorption of oxygen

which the Hæmato-crystallin or Hæmoglobin fixes in the blood; the vital processes depending upon oxygenation and oxidation are most imperfectly performed, carbonic acid accumulates and is absorbed by the Hæmaglobin, and its corresponding volume of oxygen displaced, and thus morbid conditions may rapidly develop and end in death by suffocation; or the poison may produce a disintegrating effect upon the blood indirectly by retarding its flow and inducing stagnation of the current in the capillary vessels, in the manner shown above. Its result is, as we all know, dropsy and anasarca. Thus a disintegrating process may go on from the outset, and become manifest when far beyond the controlling influence of curative agents.

We find evidence of this disintegrating process in the presence of albumen and often of blood corpuscles in the urine. We know that albumen, the elementary constituent of the blood, exudes in the manner aforesaid with the serum of the blood, and that it enters largely into the composition of the red blood corpuscles, furnishing the hæmatin *corp. talin* and globulin, and we have a right to infer that the diminution of these red corpuscles in the blood, stands in direct relation to the amount of albumen drawn from the system. Emaciation and pallor ensue as a natural consequence. Not only in this state is the supply diminished from which new red corpuscles can be constructed; but the morbid process going on, destroys these corpuscles in another way also:

The separation of the serum of the blood leaves the residue of the sanguineous fluid poor in solid constituents; it becomes watery and of a diminished specific gravity. In this medium the remaining blood corpuscles undergo a peculiar destructive transformation. An osmotic current is set up towards the interior of the globules; they lose their flattened and discoid forms; they swell, become globular, burst and are destroyed. We can now well understand the pathological state of the kidneys induced by this subtle poison. Yet it is strange that this formidable disease may still be mastered at this stage. It is possible that in children, if the kidneys do not suffer so extensively with other organs, relief may still be given in many cases. Yet as a general rule remedies successful in all the former stages of the disease promise a great deal less now. Yet they should be tried. Use the Infus. Coloquint., the Potass. Iodid., or the Aralia Hespida in strong decoction; avoid diuretics, but work on the bowels; the Carbonate and Acetate of Ammonia, embrocations of Oil of Turpentine, the hot mustard bath, frequent change of air and clothing, dry cupping and even leeches to the loins deserve confidence. Brandy, wine, and a generous diet will become necessary. A dangerous pulmonary complication often happens at this stage



in the form of paralysis of the respiratory nerves. We have already pointed out the causes to which these attacks may be referred, to wit, the suspended capacity of the Hæmatoecrystallin to absorb oxygen. It comes on suddenly and terminates fatally in a few hours. Here the stimulating plan seems to me the best: Quinine in large doses, Musk, Camphor, and Castoreum, the warm bath, and cold affusions. I was called to a case in 1862, where the attending physician had left his patient but an hour before and pronounced him all right. I found the little sufferer in great distress for breath, with livid countenance, puffed face, eyes sunk and glassy, the extremities cold, the pulse extremely thin and empty, but so frequent that it could not be counted. The child died within an hour after the attack. Such is the course of this formidable complication. The practitioner will here bear in mind, that internal complications at this stage will often terminate fatally, in an incredibly short time. Inflammation of the parotid and adjacent glands must be attended to immediately by the most reliable means at our command. I have seen dreadful tumefaction ensue within twenty-four hours, which no medication could control. Here principally, support to the waning powers of life, quinine in large doses, and alcoholic stimulants; externally Iodine. Be cautious if you are compelled to scarify; the parts may become gangrenous and slough. I have never tried blisters, but they are recommended by some authorities. I need not say that affections of the brain at this stage are very serious and will often prove fatal even under the best medical care. Here chloroform must be employed with extreme caution, as the following case will show: during a stormy night in December, 1862, I was called to see a child taken with convulsions. It proved to be a girl about five years of age, who had passed through the several stages of Scarlatina without trouble, had arrived at the stage of desquamation, and so far as I could learn, after partaking of a hearty meal of soft eggs, had been seized with convulsions. I exhibited Chloroform as an anæsthetic.

Twenty or thirty drops sufficed to allay the muscular contractions, and I congratulated myself already upon the rapid success of my remedy, when I discovered to my dismay that respiration became intermittent, and ceased altogether. The desperate condition of the patient gave me great concern, because I had used the drug against the wish of the parents. I began, however, to rub the patient vigorously with a cloth brush over the whole body, had hot brandy applied, with mustard, and resorted to artificial respiration for more than three-quarters of

an hour, when to my unspeakable joy, respiration gradually returned, and under the influence of zinc and calomel, the patient speedily recovered. Gastric symptoms also must be promptly attended to. Where emesis exists, with cold extremities and small pulse, with great exhaustion, I have derived in some cases a very decided benefit from the following mixture:

R	Aq. Ment. piper.	}	aa.	3vi.
	" Camphoris.			
	" Cinnam.			
	Liquor. Ammon. Succin.			3i
	Tinct. Opii. Camph.			3ii
	Aq. Nucis Vomic. Rodemacher.			3i
	Syrup. Gum. mimos.			3i
	Misce. S. a teaspoonful every hour.			

Externally spirituous fomentations and the volatile Liniment, Oil of Turpentine, and Cantharides in tincture. Ice-pills internally with brandy may be given. Be careful not to give opiates, except in small doses fatal consequences may follow their careless employment. Where all nourishment is ejected, try pepsine and the extractum carnis, prepared after Liebig's method; or give enemas of beef or chicken broth. In scrofulous children the abdominal glands enlarge and become indurated, interfering considerably with the nutritive process; here frequent baths with malt, and the internal use of the Syrup of the Iodide of Iron has served me well in some very troublesome cases.

Often without any discernible cause a hectic fever appears in this stage, which endangers the patient's life. It may continue for weeks, exhausting the strength of the patient. I have saved quite a number of cases thus affected, by the persistent use of the mineral acids, combined with Quinine, wine and a generous diet. I suspect that when the hectic fever thus appears, it is occasioned by the presence of a portion of the scarlet fever poison which has not been eliminated from the system, and which has not localized itself. In scrofulous children its presence in the blood may light up low, destructive lung complaints, or, as in the case where it manifests itself in hectic fever, rapidly induces marasmus and death. Quite frequently we observe destructive ulcerations and erysipelatous inflammations ensue as a sequel, which are rapid in their course and unmanageable by treatment. I have seen but few of these cases and those during the years 1853-54-55; but not a single case since; and I cannot recommend any other treatment than what may have proved successful in the hands of other practitioners, and what may seem proper to the rational physician, acting upon general and well authenticated principles.









